

REMARKS

Claims 20-26, 32-39 and 58-84 are now pending in the present application. Claims 1-19, 27-31 and 40-57 have been canceled by a previous Amendment and claims 81-84 have been added. Claims 20, 32, 62 and 69 are independent. Reconsideration of this application, as amended, is respectfully requested.

Interview with Examiner

An interview was conducted with the Examiner in charge of the above-identified application on July 18, 2006. Applicants' representative greatly appreciates the courtesy shown by the Examiner during the interview.

In the interview with the Examiner, it was explained to the Examiner that the Kazem-Goudarzi et al. and Whitman references fail to provide a sufficient teaching of a processing means/processor that estimates the time needed for repair and calculates the overall time required for corrective action. The Examiner agreed that the Kazem-Goudarzi et al. and Whitman references do not explicitly disclose this aspect of the present invention. However, the Examiner indicated that further search would be necessary.

The Examiner suggested that the arguments presented in the Amendment dated January 23, 2006 be re-presented for consideration by the Examiner. In view of this, the following comments with regard to the prior art rejections by the Examiner are presented for the Examiner's consideration.

Rejection Under 35 U.S.C. § 103

Claims 20-26, 32-34, 36-39, 58-71 and 73-80 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art in view of Kazem-Goudarzi et al., U.S. Patent No. 5,108,024 and Whitman, U.S. Patent No. 6,026,176. Claims 35 and 72 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over the admitted prior art in view of Kazem-Goudarzi et al., and Whitman, as applied to claims 32 and 69 above, and further in view of Hikita et al., U.S. Patent No. 5,740,726. These rejections are respectfully traversed.

The present invention is directed to an apparatus for providing a substrate with viscous medium. Independent claim 20 recites a combination of elements including “application means for applying the viscous medium onto the substrate at a plurality of locations” and “inspection means for inspecting the results of said application at more than one of the plurality of locations after completion of the application at the plurality of locations.” In addition, independent claim 20 recites “processing means for determining application errors based on said inspection, estimating the time required for performing corrective action for each of the determined errors, and calculating the overall time required for corrective action of all determined errors.”

Independent claim 32 of the present invention recites a combination of elements including “an applicator, said applicator applying the viscous medium onto the substrate at a plurality of locations” and “an inspection device, said inspection device inspecting the results of said application at more than one of the plurality of locations after completion of the application at the plurality of locations.” In addition, independent claim 32 recites “a processor, said processor determining application errors based on said inspection, estimating the time required for performing corrective

action for each of the determined errors and calculating the overall time required for corrective action of all determined errors.”

With the above structure according to the present invention, it is possible to inspect more than one location on a substrate after completion of an application of viscous medium at a plurality of locations. In addition, since it is possible to calculate the time required to perform corrective action of all determined errors, correction can be performed only in situations where the time for correction is not too long. Applicants respectfully submit that the references relied on by the Examiner fail to teach or suggest the presently claimed invention and therefore cannot accomplish the above advantages of the present invention.

The Examiner relies on “the admitted prior art” on pages 1 and 2 of the present specification to disclose inspection of electronic circuit boards to determine errors. The measured errors are fed back to the process control and used to reduce future errors.

As appears to be recognized by the Examiner, “the admitted prior art” fails to disclose “correction means” or a “correction device” as recited in independent claims 20 and 32, respectively. In “the admitted prior art,” a defective circuit board is simply discarded or cleaned and reinstated at the beginning of the process. In addition, Applicants submit that “the admitted prior art” fails to disclose the “processing means” and the “processor” as recited in independent claims 20 and 32, respectively. Finally, Applicants submit that the admitted prior art fails to disclose the specific inspection means of the presently claimed invention that inspects the results of an application “after completion of the application” of viscous medium at “a plurality of locations” as recited in independent claims 20 and 32. In view of this, the admitted prior art discloses only the

“application means/applicator” recited in independent claims 20 and 32 of the present invention and a general concept of inspecting a circuit board (the inspection having nothing to do with eventual correction of the circuit board), but only to do with preventing further errors).

To the Extent the Examiner has relied on page 1, lines 12-25 of the present specification as a teaching of the prior art, Applicants submit that this portion of the specification is “background” art, but is not “prior” art. In other words, this portion of the specification is not statutory prior art under U.S. Law. Specifically, page 1, lines 12-25 of the present specification discuss International Publication No. WO/00/42381, which was published on July 20, 2000. The present application claims priority on Swedish Application No. 0002618-7, which was filed on July 11, 2000, which is prior to the publication date of the WO/00/42381 Application. The claim to priority of the Swedish Application was perfected on September 20, 2001 by filing a certified copy of the Swedish priority document. Since the Swedish Application was filed in English (a copy of which is attached to the present Amendment for the Examiner’s convenience), it is not necessary to submit a translation of the Swedish Application to perfect the claim to priority.

With regard to the Kazem-Goudarzi et al. reference, the Examiner relies on this reference in order to disclose repairing or discarding a defective component. However, Kazem-Goudarzi et al. is silent with regard to how the component would be repaired. In addition, Kazem-Goudarzi et al. is silent with regard to a “processing means/processor” that estimates the time required for performing corrective action or calculates the overall time required for corrective action as recited in independent claims 20 and 32. In view of this, the Kazem-Goudarzi et al. reference fails to make up for the deficiencies of “the admitted prior art.”

The Examiner relies on the Whitman reference to disclose a vision system that evaluates a ball grid array that has already been created. A processor determined the errors and corrects them accordingly. Applicants respectfully submit that the Examiner's understanding of the Whitman reference is incorrect. The device of Whitman does not correct any errors in the ball grid array. The device of Whitman merely locates solder bumps on the ball grid array. If an expected solder bump is missing, then the device of Whitman looks further for the missing solder bump. If the missing solder bump is not found, then the ball grid array is failed. Specifically, referring to Figure 2a, step 2.4.3, if a ball is missing, then step 2.4.3.1 uses a local locator to attempt to locate the missing ball. At step 2.4.3.2, if the missing ball is found, then the grid is updated (a further ball is located). There is absolutely no disclosure in the Whitman reference of correcting any errors in the ball grid array. In the Whitman device, the only thing that is corrected is the grid, i.e. the pattern of located solder bumps.

In view of the above, Whitman fails to make up for the deficiencies of "the admitted prior art" and the Kazem-Goudarzi et al. reference. In view of this, none of the references relied on by the Examiner disclose a "processing means/processor" that estimates the time required to perform corrective action or calculates the overall time required for corrective action as recited in independent claims 20 and 32 of the present invention. In addition, none of the references relied on by the Examiner disclose any particular correction means/device as recited in independent claims 20 and 32 of the present invention. Therefore, the references relied on by the Examiner fail to render obvious the presently claimed invention.

With regard to independent claims 62 and 69, these claims also recite “processing means” and “a processor,” respectively, in the same manner as in independent claims 20 and 32, respectively. In view of this, independent claims 62 and 69 are allowable for the same reasons mentioned above with regard to independent claims 20 and 32.

With regard to dependent claims 21-26, 33-39, 58-61, 63-68 and 70-80, Applicants respectfully submit that these claims are allowable due to their respective dependence on independent claims 20, 32, 62 and 69, as well as due to the additional recitations in these claims.

In view of the above amendments and remarks, Applicants respectfully submit that claims 20-26, 32-39 and 58-80 clearly define the present invention over the references relied on by the Examiner. Accordingly, reconsideration and withdrawal of the Examiners’ rejections under 35 U.S.C. § 103 are respectfully requested.

Additional Claims

Additional claims 81-84 have been added for the Examiner’s consideration. Applicants respectfully submit that these claims are allowable due to their respective dependence on independent claims 20, 32, 62 and 69, as well as due to the additional recitations in these claims.

Favorable consideration and allowance of additional claims 81-84 are respectfully requested.

CONCLUSION

Since the remaining references cited by the Examiner have not been utilized to reject the claims, but merely to show the state of the art, no further comments are deemed necessary with respect thereto.

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Paul C. Lewis, Registration No. 43,368 at (703) 205-8000 in the Washington, D.C. area.

Docket No. 0104-0353P
Appl. No. 09/902,110
Amendment dated July 24, 2006
Reply to Office Action of April 24, 2005
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If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Respectfully submitted,

Date: JULY 24, 2006

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Attachment: Copy of Swedish Application No. 0002618-7